**B0574**

**Biomechanical comparison of cross-suture and vertical suture technique in meniscal repair of radial tear**

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**Background**: Although meniscal repair techniques have developed for several decades, meniscal repair of radial tears still remains challenging issue. For successful meniscal healing of radial tears, primary mechanical stability of meniscal repair is one of the essential requirements. All-inside vertical suture[1] and Cross-suture techniques[2] have been reported to provide superior stability compared to inside-out horizontal suture technique respectively. However, biomechanical comparison between vertical and Cross-suture technique in meniscal repair of radial tear was not performed yet.
**Purpose**: The aim of this biomechanical study was to evaluate whether Cross-suture technique can show comparable stability to vertical suture technique in meniscal repair of radial tears.
**Material & Method**: Biomechanical test was performed on matched paired 60 fresh-frozen porcrine menisci (3 groups, n=20 in each group). Complete radial tear was made at the mid-portion of each meniscus. In group A, menisci were repaired with parallel 2 stitch of inside-out horizontal sutures for control. In group B, menisci were repaired with 2 stitch of inside-out cross sutures. In group C, menisci were repaired with parallel 2 stitch of all-inside vertical sutures. Suture attachments were located at 5mm from the tear surface and 5mm and 10mm from the rim in all cases. The specimens were cyclically loaded 500 times between 5 and 20 N, then gap of tear surface was measured. After completion of cyclic load testing, specimens were loaded to failure**.**
**Results**: The mean maximum failure load were $72 \pm 15$N (inside-out horizontal suture), $88 \pm 20$N (inside-out cross suture), and $105 \pm 27$N (all-inside vertical suture). The mean displacement after a 500-cycle loading test were $5.23 \pm 1.82$mm (inside-out horizontal suture), $4.56 \pm 1.87$mm (inside-out cross suture), and $3.23 \pm 1.67$mm (all-inside vertical suture). Cross suture technique showed significantly higher failure load compared with horizontal suture technique ($p<.05$). However, cross suture technique also showed significantly lower failure load ($p<.05$) and increased displacement ($p<.05$) compared with vertical suture technique.
**Discussion**: In respect that both cross suture and vertical suture were superior to horizontal suture, our results matched with recent biomechanical studies which analyzed mechanical stability of horizontal suture technique, vertical suture technique, and newly suggested cross suture techniques. Also, new finding of our study was that vertical suture was superior to cross suture, as well as horizontal suture technique.
**Conclusion**: Despite superior stability over horizontal suture technique, biomechanical properties of cross suture technique was not comparable to vertical suture technique in meniscal repair of complete radial tear. Cross suture technique can be a recommendable choice over horizontal suture technique when all-inside vertical repair is impossible.
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**B0575**

**Analgesic effect and safety of single-dose intra-articular magnesium after arthroscopic surgery: A systematic review and meta-analysis**

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**Objective**: To examine the analgesic effect and safety of single-dose intra-articular (IA) magnesium (Mg) after arthroscopic surgery.
**Material**: Pubmed, Embase and Cochrane library were searched through in January 2016.
**Method**: Randomized controlled trails (RCTs) that evaluate the effects of single-dose IA in comparisons of (1) Mg versus placebo, (2) Mg versus bupivacaine and (3) Mg plus bupivacaine versus bupivacaine alone after arthroscopic surgery. Additionally, in vitro and in vivo experimental studies of Mg supplementation were also targeted.
**Results**: A total of eight RCTs and eight experimental studies were included. IA Mg exhibited a significantly lower pain score after arthroscopic surgery when compared with placebo (MD, -0.41, 95% CI, -0.78 to -0.05, $p<0.05$). Meanwhile, Mg and bupivacaine presented the similar postoperative pain level and time to first analgesic request. Furthermore, statistically significant differences both in pain score (MD, -0.62, 95% CI, -0.81 to -0.42, $p<0.05$) and time to first analgesic request (MD, 6.25, 95% CI, 5.22 to 7.29, $p<0.05$) were observed between Mg plus bupivacaine and bupivacaine alone. There was no statistically significant difference between various groups in each separate trial with respect to side effects, and it seemed that none of the witnessed side effects was related to IA injection. Most of the included in vitro studies showed a chondrocyte protective effect of Mg supplementation, with only two exceptions which suggested that high level of Mg might exhibit an opposite effect. There were also two in vivo studies showing a cartilage protective effect of IA Mg.
**Discussion**: This systematic review and meta-analysis was performed on a total of 8 RCTs (published 2006 to 2015) and 8 in vitro and in vivo experimental studies. The most important finding of the present study is that the administration of single-dose IA Mg at the end of arthroscopic surgery was effective in pain relief without increasing side effects when compared with placebo, and exhibited a comparable analgesic effect in comparison with bupivacaine. In addition, IA Mg could enhance the analgesic effect of bupivacaine. Another important finding is that Mg seemed to possess cartilage or chondrocyte protective effects according to the included experimental studies. Thus, IA Mg should perhaps be considered as an alternative to local anesthetics for pain relief after arthroscopic surgery. However, the optimal concentration and dosage of IA Mg still needs to be further explored.
**Conclusions**: Single-dose IA Mg at the end of arthroscopic surgery was effective in pain relief without increasing side effects, and it could also enhance the analgesic effect of bupivacaine. In addition, Mg seemed to exhibit the cartilage or chondrocyte protective effect according to the experimental studies. Perhaps IA Mg should be considered as an alternative to local anesthetics after arthroscopic surgery. However, the optimal concentration and dosage of IA Mg still needs to be further explored.
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**B0578**

**Arthroscopic antegrade drilling for unstable juvenile osteochondritis dissecans of the knee: Mid-term results**

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**Background**: The aim of our study was to retrospectively review the mid-term clinical and imaging outcomes of unstable knee juvenile osteochondritis dissecans (JOCD) patients treated with trans-articular drilling.
**Methods**: 63 patients diagnosed as knee JOCD and treated with trans-articular drilling between 2006 and 2012 were enrolled in the study. Arthroscopically trans-articular drilling was performed. Lysholm, Tegner, as well as International Knee Documentation Committee (IKDC) scores were recorded and compared preoperatively and at the latest follow-up. Antero-posterior, lateral, and tunnel view knee radiographs were used to examine healing status, and magnetic resonance imaging (MRI) was employed as verification.
**Results**: The mean follow-up time was 4.2 years (range, 1-7.3 years), and 52 patients finished the follow-up. The average defect size was 2.79 $cm^2$ (range, 1-4 $cm^2$). 43 patients had excellent outcomes with full return to pre-injury activities and reported no symptom recurrence or deterioration over time. The overall healing rate was 82.7% (43/52). The average Lysholm score was improved from 51.3 to 85.8 ($P = 0.001$). The mean Tegner activity level was improved from 3.7 to 6.7 ($P = 0.013$). And the mean IKDC score was improved from 55.7 to 73.2 ($P = 0.007$). On average, evidence of healing was observed at 11.3 months after surgery (range, 6-18 months). **Conclusions**: Our series showed good to excellent mid-term results in unstable JOCD patients of the knee treated with trans-articular drilling. This technique is minimal invasive, effective, as well as cost-effective.
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**B0579**

**Preoperative measure of individualized anatomic ACL reconstruction in west Chinese patients: Correlation between preoperative MRI and intra-operative measurements**

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**Purpose**: This study was to identify coronal and sagittal length of tibial insertion, tibial insertion site area, length and inclination angle of ACL of patients undergoing ACL reconstruction. The secondary aim was to evaluate the correlation of the measurements between gender, age, BMI, Height and weight.
**Methods**: Sixty nine patients undergoing ACL reconstruction, a preoperative measurement on MRI and intra-operative measurements using a specialized ruler were going to detected the coronal and sagittal length of tibial insertion, tibial insertion site area, length and inclination angle of ACL. Additionally, correlation among gender, age, BMI, Height, weight, BMI and the measurements was analyzed.
**Results**: The tibial insertion site coronal length of ACL had a mean length of $9.7 \pm 1.0$ mm (7.7-12.8 mm) as measured by MRI, and $9.5 \pm 1.0$ mm (7.5-12 mm) as measured intra-operatively. The tibial insertion site sagittal length was $11.5 \pm 1.5$ mm (8.5-14.9 mm) by MRI and $11.1 \pm 1.6$ mm (8.5-14.5 mm) in arthroscopic. The tibial insertion site area was $87.5 \pm 16.0$ $mm^2$ (59.3-149.8 $mm^2$) by MRI and $83.2 \pm 16.5$ $mm^2$ (53.4-136.6 $mm^2$) in arthroscopic , and intercondylar notch width was $13.2 \pm 1.9$ mm (7.5-16.6 mm) and $13.3 \pm 2.0$ mm (8-18 mm), ACL length was $34.0 \pm 4.5$ mm (25.2-46.1 mm) and ACL inclination angle was $45.9 \pm 5.9°$(32.4-56.8°) by MRI. Then , the male and female date was also measured, and there was no significant different between the measurements and gender, height, weight, BMI or age of the patients besides the intercondylar notch width correlated with the height, weight and BMI, and ACL length have correlation with height.